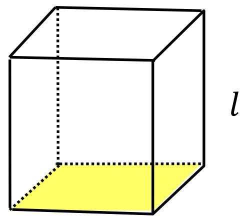
Volumi $\mathcal{V}$ e superfici $\mathcal{S}$ delle principali figure solide

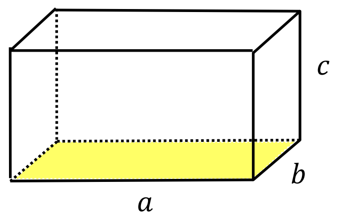
cubo



$$\mathcal{V} = l^3$$

$\mathcal{S}_B = 2l^2$ | $\mathcal{S}_L = 4l^2$

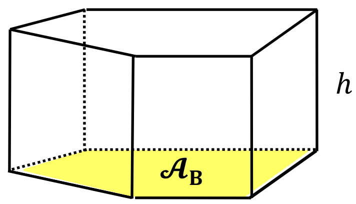
parallelepipedo rettangolo



$$\mathcal{V} = a \cdot b \cdot c$$

$\mathcal{S}_B = 2ab$ | $\mathcal{S}_L = 2(a+b)c$

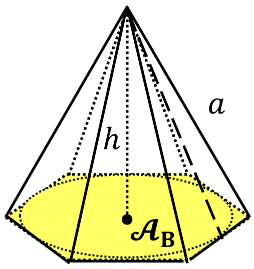
prisma retto



$$\mathcal{V} = \mathcal{A}_B \cdot h$$

$\mathcal{S}_B = 2\,\mathcal{A}_B$ | $\mathcal{S}_L = \text{perimetro di base} \cdot h$

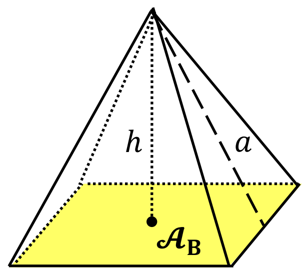
piramide retta a base regolare



$$\mathcal{V} = \frac{\mathcal{A}_B \cdot h}{3}$$

$\mathcal{S}_B = \mathcal{A}_B$ | $\mathcal{S}_L = \dfrac{\text{perimetro di base} \cdot a}{2}$

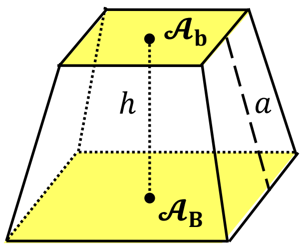
piramide retta



$$\mathcal{V} = \frac{\mathcal{A}_B \cdot h}{3}$$

$\mathcal{S}_B = \mathcal{A}_B$ | $\mathcal{S}_L = \text{somma aree facce laterali}$

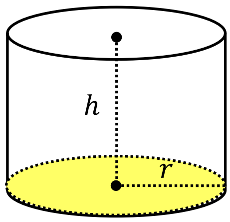
tronco di piramide



$$\mathcal{V} = \frac{1}{3} h\left(\mathcal{A}_B + \mathcal{A}_b + \sqrt{\mathcal{A}_B \mathcal{A}_b}\right)$$

$\mathcal{S}_B = \mathcal{A}_B + \mathcal{A}_b$ | $\mathcal{S}_L = \text{somma aree facce laterali}$

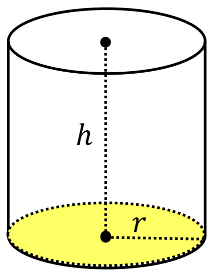
cilindro



$$\mathcal{V} = \pi\, r^2 \cdot h$$

$\mathcal{S}_B = 2\,\pi\, r^2$ | $\mathcal{S}_L = 2\,\pi\, r\, h$

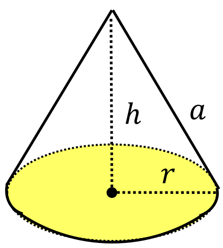
cilindro equilatero ($h = 2r$)



$$\mathcal{V} = 2\,\pi\, r^3$$

$\mathcal{S}_B = 2\,\pi\, r^2$ | $\mathcal{S}_L = 4\,\pi\, r^2$

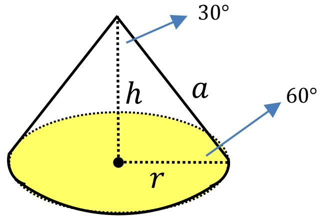
cono



$$\mathcal{V} = \frac{\pi\, r^2 \cdot h}{3}$$

$\mathcal{S}_B = \pi\, r^2$ | $\mathcal{S}_L = \pi\, r\, a$

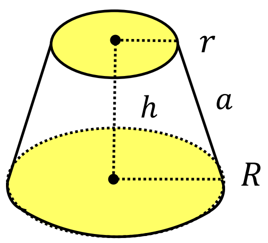
cono equilatero ($a = 2r \quad h = \sqrt{3}\, r$)



$$\mathcal{V} = \frac{\pi\, r^3}{\sqrt{3}}$$

$\mathcal{S}_B = \pi\, r^2$ | $\mathcal{S}_L = 2\,\pi\, r^2$

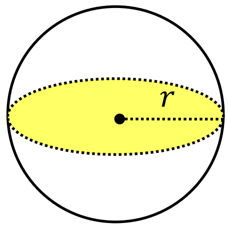
tronco di cono



$$\mathcal{V} = \frac{1}{3}\pi\, h(R^2 + r^2 + Rr)$$

$\mathcal{S}_B = \pi(r^2 + R^2)$ | $\mathcal{S}_L = \pi(r+R)a$

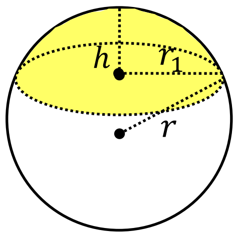
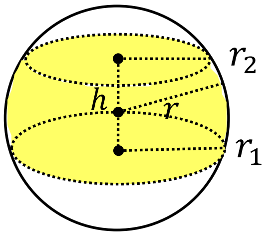
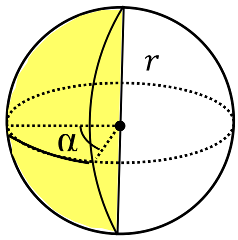
sfera

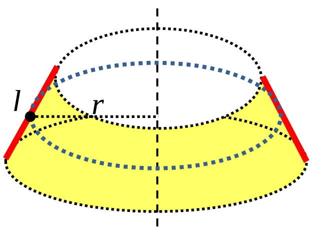
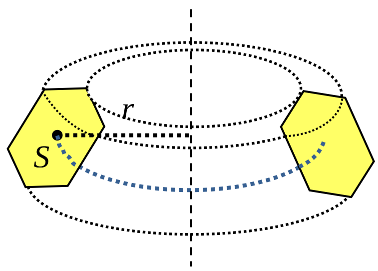


$$\mathcal{V} = \frac{4}{3}\pi\, r^3$$

$\mathcal{S} = 4\,\pi\, r^2$

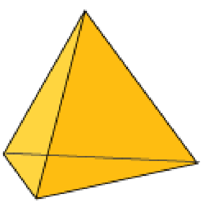
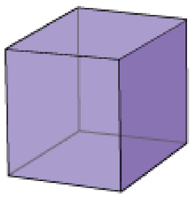
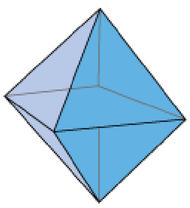
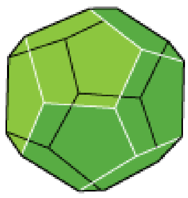
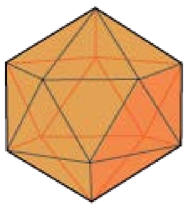
Volumi $\mathcal{V}$ e superfici $\mathcal{S}$ delle principali figure solide

segmento sferico ad 1 base	segmento sferico a 2 basi	spicchio sferico
		
$\mathcal{V} = \frac{h}{2}\pi\, r_1^{\,2} + \frac{4}{3}\pi\left(\frac{h}{2}\right)^3$	$\mathcal{V} = \frac{h\pi}{2}(r_1^{\,2} + r_2^{\,2}) + \frac{4}{3}\pi\left(\frac{h}{2}\right)^3$	$\mathcal{V} = \frac{\alpha^\circ}{270^\circ}\pi\, r^3 = \frac{2}{3}\pi\, r^3 \alpha_{rad}$
$\mathcal{S} = 2\,\pi\, r\, h$	$\mathcal{S} = 2\,\pi\, r\, h$	$\mathcal{S} = \frac{\alpha^\circ}{90^\circ}\pi\, r^2 = 2\pi\, r^2 \alpha_{rad}$

1^0 teorema di Guldino	2^0 teorema di Guldino
la **superficie** generata da una linea (o da un poligono) in rotazione intorno ad un asse è uguale al prodotto della circonferenza descritta dal suo baricentro per la sua lunghezza (o perimetro)	il **volume** generato da una superficie in rotazione intorno ad un asse è uguale al prodotto della circonferenza descritta dal suo baricentro per la sua superficie
	
$\mathcal{S} = 2\,\pi\, r\, l$	$\mathcal{V} = 2\,\pi\, r\, S$

solidi platonici o poliedri regolari

I solidi platonici sono quei solidi le cui facce, tutte uguali tra loro, sono formate da poligoni regolari e tali che in ogni vertice concorrono lo stesso numero di spigoli. Sono solo cinque:

tetraedro 4 triangoli equilateri	*esaedro (cubo)* 6 quadrati	*ottaedro* 8 triangoli equilateri	*dodecaedro* 12 pentagoni regolari	*icosaedro* 20 triangoli equilateri
				

Il volume dei solidi platonici si calcola moltiplicando il cubo dello spigolo per un numero caratteristico del solido:

$\mathcal{V} = l^3 \cdot 0,1179$	$\mathcal{V} = l^3$	$\mathcal{V} = l^3 \cdot 0,4714$	$\mathcal{V} = l^3 \cdot 7,6631$	$\mathcal{V} = l^3 \cdot 2,1817$

formula di Eulero

Indicato con:

- **poliedro** = solido dello spazio la cui frontiera è l'unione delle facce
- **faccia** = figura piana che compone il poliedro
- **spigolo** = segmento di incontro delle facce
- **vertice** = punto di incontro degli spigoli

per tutti i poliedri vale la **formula di Eulero**: $\boldsymbol{Facce + Vertici - Spigoli = 2}$